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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/686,136	10/15/2003	Azar Alizadeh	136393-1	7594

7590 12/28/2005

Kelly K. Kordzik
Winstead Sechrest & Minick P.C.
1201 Main Street
P.O. Box 50784
Dallas, TX 75250-0784

EXAMINER

VU, HUNG K

ART UNIT PAPER NUMBER

2811

DATE MAILED: 12/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/686,136

Applicant(s)

ALIZADEH ET AL.

Examiner

Hung Vu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 October 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-13 and 15-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-13 and 15-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 6, 8-10, 12-13, 15-17, 19 and 20 are rejected under 35 U.S.C. 102(e) as being anticipated by Hasegawa et al. (PN 6,709,881, of record).

Hasegawa et al. discloses, as shown in Figures 5C – 9, a device comprising:

a substrate (11);

nanostructures of wide bandgap material (14,15,16), wherein the nanostructures of wide bandgap material comprise an n-type portion (14) and a p-type portion (16) and wherein the nanostructures of wide bandgap material are selected from the group consisting of low-defect nanostructures of wide bandgap material, quantum confined nanostructures of wide bandgap material, surface confined nanostructures of wide bandgap material, and combinations thereof, and wherein the nanostructures of wide bandgap material are selected from the group consisting of quantum dots, quantum wires (or layers) (which is MQW), and combinations thereof.

Regarding claim 8, Hasegawa et al. discloses the device further comprising a nucleation layer (12) interposed between the substrate and the nanostructures of wide bandgap material.

Regarding claim 9, Hasegawa et al. discloses the substrate comprises a material selected from the group consisting of sapphire.

Regarding claim 10, Hasegawa et al. discloses the nucleation layer comprises a material selected from the group consisting of GaN, InGaN, AlN, InN, BN, $B_xAl_yIn_zGa_{1-x-y-z}N$, and combinations thereof.

Regarding claim 12, Hasegawa et al. discloses the nucleation layer and the wide bandgap nanostructures comprise a common material (GaN).

Regarding claim 13, Hasegawa et al. discloses the wide bandgap nanostructures are selected from the group consisting of group III nitrides, III-V semiconductors, II-VI semiconductor, $Al_xGa_{1-x}As$, $In_xGa_{1-x}As$, AlP, AlAs, AlSb, GaP, GaN, GaAs, GaSb, InP, InAs, InSb, SiC, ZnO_2 , and combinations thereof.

Regarding claim 15, Hasegawa et al. discloses the wide bandgap nanostructures are selected from the group consisting of nanostructures that are homogeneous in size and shape, nanostructures that are heterogeneous in size and shape, and combinations thereof.

Regarding claim 16, Hasegawa et al. discloses the p-type portion of the wide bandgap material is p-doped with atoms selected from the group consisting of Mg.

Regarding claim 17, Hasegawa et al. discloses the n-type portion of the wide bandgap material is n-doped with atoms selected from the group consisting of Si.

Regarding claim 19, Hasegawa et al. discloses the device further comprising electrodes, wherein at least one electrode (23) is in ohmic contact with an n-type region and at least one electrode (24) is in ohmic contact with a p-type region of the nanostructures of wide bandgap material.

Regarding claim 20, Hasegawa et al. discloses the device further comprising at least one cladding layer (13).

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 7, 11, 18 and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hasegawa et al. (PN 6,709,881).

Regarding claims 7 and 11, Hasegawa et al. discloses the claimed invention including the device as explained in the rejection above. Hasegawa et al. does not disclose the substrate comprises a conductive material or bulk GaN with the density as claimed. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to form the

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substrate of Hasegawa et al. comprising a conductive material or bulk GN, as that claimed by Applicant, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

Regarding claim 18, Hasegawa et al. discloses the claimed invention including the device as explained in the rejection above. Hasegawa et al. does not disclose the density of the wide bandgap nanostructures. Although Hasegawa et al. does not teach the density of the wide bandgap nanostructures, as that claimed by Applicants, however, it would have been obvious to one having ordinary skill in the art at the time the invention was made to form the wide bandgap nanostructures having a desired density, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980).

Regarding claims 21-24, Hasegawa et al. discloses the claimed invention including the device as explained in the rejection above. Hasegawa et al. further discloses the device is used for the semiconductor laser device. Hasegawa et al. does not disclose the device is operable as a solid state optical emitter, a light emitting diode, and the laser diode. However, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the device of Hasegawa et al. to operate as a solid state optical emitter, a light emitting diode, and the laser diode depending on the desired application as a matter of intended use.

Response to Arguments

3. Applicant's arguments filed 10/17/05 have been fully considered but they are not persuasive.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., nanostructures of wide bandgap material that are nanoscale in at least two dimensions) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hung Vu whose telephone number is (571) 272-1666. The examiner can normally be reached on Tuesday to Friday 6:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (571) 272 - 1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Vu

December 24, 2005

A handwritten signature in black ink, appearing to read 'Hung Vu', is written over a horizontal line.

Hung Vu

Primary Examiner